touches the scroll wheel. In some embodiments, the user's touch can be a slide, rotate, press, translate, tap, or the like motion.

[0140] FIG. **20** illustrates an exemplary touch sensing device having a user interface that can change topography to form a keypad according to embodiments of the invention. In the example of FIG. **20**, touch sensing device **200** can have a desired user interface state in which the user interface can form keypad **204**. As such, shape changeable nodes (such as nodes **182** of FIG. **18**) located where the keypad **204** should be can be raised and/or lowered on the surface **201**, thereby informing the user of the location of the keypad to be touched. The shape changeable nodes forming boundaries **204**-*b* of the keys can be raised and shape changeable nodes forming keys **204**-*a* can be unaltered, resulting in recesses for the keys. In some embodiments, the shape changeable nodes can have adjustable character identifiers, described below, to display numbering on the keypad. In some embodiments, the shape changeable nodes forming the boundaries of the keys can be raised to inform the user where the keys are for touching. Alternatively, the keys themselves can be raised. A computing system can have functions associated with the keypad **204** that can execute when the user touches the keys of the keypad.

[0141] FIG. **21** illustrates an exemplary touch sensing device having a user interface that can change topography to form push buttons according to embodiments of the invention. In the example of FIG. **21**, touch sensing device **210** can have a desired user interface state in which the user interface can form a plurality of push buttons **214**. As such, shape changeable nodes (such as nodes **182** of FIG. **18**) located where the push buttons **214** should be can be raised and/or lowered on the surface **211**, thereby informing the user of the location of the push buttons to be touched. The shape changeable nodes forming push buttons **214**-*a* can be raised. The remaining nodes can be unaltered and/or deactivated and the underlying touch sensors can be deactivated to provide null areas **214**-*b* that do not respond to touch or change shape. Alternatively, the push buttons **214** can be recessed. A computing system can have functions associated with the push buttons **214** that can execute when the user touches the push buttons.

[0142] FIG. **22** illustrates an exemplary touch sensing device having a user interface that can change topography to form a scroll wheel according to embodiments of the invention. In the example of FIG. **22**, touch sensing device **220** can have a desired user interface state in which the user interface can form scroll wheel **226**. As such, shape changeable nodes (such as nodes **182** of FIG. **18**) located where the scroll wheel **226** should be can be raised and/or lowered on the surface **221**, thereby informing the user of the location of the scroll wheel to be touched. The shape changeable nodes forming center button **226**-*c* can be raised to form a dome and the shape changeable nodes forming the outer boundary **226**-*a* can be raised to form a rounded border. The shape changeable nodes forming the scroll wheel circle **226**-*b* can remain unaltered. Similar other embodiments to those of FIG. **19** can apply here. In some cases, a lowered portion can be used to create separate portions of the rounded border with each separate section offering a different functionality (e.g., button). A computing system can have functions associated with the scroll wheel **226** that can execute when the user touches the scroll wheel. In some embodiments, the user's touch can be a slide, rotate, press, translate, tap, or the like motion.

[0143] FIG. **23** illustrates an exemplary touch sensing device having a user interface that can change topography to form a scroll wheel and push buttons according to embodiments of the invention. In the example of FIG. **23**, touch sensing device **230** can have a desired user interface state in which the user interface can form push buttons **237** and scroll wheel **238**. As such, shape changeable nodes (such as nodes **182** of FIG. **18**) located where the push buttons **237** and the scroll wheel **238** should be can be raised and/or lowered on the surface **231**, thereby informing the user of the location of the push buttons and scroll wheel to be touched. The shape changeable nodes forming push buttons **237** can be lowered to form recesses. The shape changeable nodes forming the center button boundary and the outer boundary **238** can be lowered to form recessed channels. Similar other embodiments to those of FIG. **19** can apply here. A computing system can have functions associated with the push buttons **237** and the scroll wheel **238** that can execute when the user touches the push buttons or the scroll wheel. In some embodiments, the user's touch on the scroll wheel **238** can be a slide, rotate, press, translate, tap, or the like motion.

[0144] In some embodiments, each shape changeable node can include an adjustable character identifier that can change according to the user interface state. For example, in a phone state, as in FIG. **20**, the shape changeable nodes can create the keypad and the adjustable identifiers can produce the numbering for each key. In a media player state, the shape changeable nodes can create a navigation pad and the adjustable identifiers can produce the control characters, such as "menu," "play/pause," and the like. This can for example be accomplished with illumination, mini displays, and the like. Adjustable character identifiers are disclosed in U.S. patent application Ser. No. 10/722,948, entitled "Touch Pad for Handheld Device," and Ser. No. 11/591,752, entitled "Touch Pad with Symbols Based on Mode," the contents of which are incorporated herein by reference in their entirety for all purposes.

[0145] In the examples of FIGS. **18** through **23**, the shape changeable nodes can have a flexible membrane that can be stretched, retracted, or otherwise flexed by underlying movable or deformable parts. The individual nodes or the shape changeable membrane can also be used instead of the flexible membrane.

[0146] As shown in FIGS. **18** through **23**, certain nodes of the user interface can raise above or lower below the initial surface, some can remain at their previous state above or below the initial surface, some can return to the initial surface, and some can remain unaltered in the initial surface, depending on the requirements for the user interface state. The user interface surface can be flat, as illustrated here, curved, or any other suitable shape capable of changing topography to provide a user interface. The user interface states can be based on a mode or operational state of a host device. This can be especially helpful in multifunctional devices, i.e., devices that incorporate separate function into a single device. For example, devices that include phone and music player functionality can utilize the embodiment shown in FIG. **20** when in a phone mode and can utilize the embodiment shown in FIG. **19** when in a music player mode.

[0147] It is to be understood that the shape changeable user interface is not limited to the user interface states illustrated here, but can include any state that can provide a user interface. In some instances, multiple user interface states can be combined.